Supplementary Online Material

Methods of Pilot Study

The pilot study involved the same stimuli and procedures as the main study with minor exceptions. Those differences are reported here. Twenty-eight students (19 female; M_{age} = 20.71 years, SD_{age} = 1.44 years) participated in exchange for $10 and were randomly assigned to a *neutral* or *compassion* emotion induction. Participants completed two blocks of emotion inductions (See Table S1 for induction content) and similarity judgments. In each block, participants listened to two audio clips selected to evoke a neutral or compassionate state. In total, participants listened to four compassion or four neutral clips presented in random order across two blocks. Participants then completed 150 unique similarity judgments immediately following each block of the listening task. Participants rated the similarity of all possible pairs of 25 emotion-related adjectives. The terms included *activated, afraid, alert, angry, in awe, bored, calm, compassionate, concerned, distressed, embarrassed, excited, grateful, guilty, happy, loving* (defined by the experimenter as an affectionate feeling for any person, rather than an exclusive feeling for a romantic partner), *proud, quiet, sad, still, sorrowful, sympathetic, tender, upset,* and *warm* (the term *troubled*, although used in self-reported ratings, was unintentionally left out of the similarity ratings). Unlike the main study, which collected two separate sets of 105 similarity judgments, the pilot study collected a single set of 300 similarity judgments divided across two blocks (fewer terms were used in the main study to allow for 2 complete sets). Participants rated their own state after completing both blocks of the induction and similarity ratings. In addition to rating their state along discrete emotion terms, participants in both studies also marked a 9×9 affect grid (Russell, Weiss, & Mendelsohn, 1989) to describe the feeling they experienced during each clip along valence (1=*unpleasant*; 9=*pleasant*) and arousal (1=*low arousal*; 9=*high arousal*) dimensions. Patterns of results from the affect grid largely matched patterns from discrete emotion ratings.

Supplementary Analyses for Pilot Study

Self-reported affect ratings. In addition to analyzing reports of various pleasant and unpleasant emotion states, we also analyzed reports of valence and arousal collected via the affect grid. Those in the *compassion* condition reported feeling more unpleasant (M = 2.86, SD = 1.04) compared with those in the *neutral* condition (M = 6.75, SD = 0.94), $t(26) = 10.43$, $p < .001$. The compassion induction also decreased arousal (M = 4.25, SD = 0.73) compared with the neutral induction (M = 5.50, SD = 0.73), $t(26) = 4.51$, $p < .001$ (see Table S1).

Similarity ratings. To compare the stability of the two-dimensional MDS solutions across conditions, we computed congruence coefficients for each dimension across the *neutral* and *compassion* solutions (Davison, 1983; Barrett, 2004). Coefficients of congruence were computed by comparing the MDS coordinates for all items on valence and arousal dimensions. The two solutions had an acceptable level of stability as indicated by congruence coefficients of .81 (valence) and .70 (arousal).

Supplemental Analyses for Main Study

Self-reported affect ratings. A mixed 2(time: baseline, critical) × 2(condition: control, compassion) ANOVA, with time as the repeated factor, revealed a significant interaction on self-reported valence, $F(1, 24) = 86.72$, $p < .001$. Post-hoc analyses revealed that, among participants in the *compassion* condition, self-reported valence was unpleasant following the critical compassion induction compared with the baseline neutral induction, $t(12) = 13.95$, $p < .001$, but no difference emerged across time points among participants in the *neutral* condition, $t(12) = 0.99$, $p > .30$ (see Table S1). Furthermore, valence was more unpleasant following the critical compassion induction compared with the critical neutral induction $t(24) = 11.84$, $p < .001$. A mixed 2(time: baseline, critical) × 2(condition: control, compassion) ANOVA, with time as the repeated factor also revealed a significant interaction on self-reported arousal, $F(1, 24) = 4.46$, $p < .05$. Participants in the *compassion* condition reported marginally less arousal following the critical compassion induction compared with the baseline neutral induction, $t(12) = 1.74$, $p < .12$. Compared with those in the neutral condition, those in the compassion condition reported less arousal following the critical induction, $t(24) = 2.71$, $p < .05$.

Similarity ratings. To compare the stability of the two-dimensional MDS solutions across conditions and inductions, we computed congruence coefficients for each dimension across the four solutions (Davison, 1983; Barrett, 2004). Coefficients of congruence were computed by comparing the MDS coordinates for all items on valence and arousal dimensions. All four solutions were nearly identical to one another (valence >.98; arousal > .97).

Supplementary Table 1.

Content of audio clips used in emotion manipulations.

Induction	Content	Pilot Study	Main Study
Compassion	A man and wife talk about the man's experience with Alzheimer's. The man expresses love for his grandson and the wife expresses her gratefulness to have the opportunity to care for the man.	Yes	Yes (critical)
	A woman tells her friend about the time she heard that her sister was killed in a subway accident. The woman says that her most prized possession is a voicemail left by her sister. The audio clip presents a portion of the voicemail, yelling out, "Hey Kendra, I love you!"	Yes	Yes (critical)
	Two sisters talk about their final Thanksgiving with their mother, who died of breast cancer shortly after. They talk about future holidays and express thanks for their mother.	Yes	No
	A couple reminisce about their daughter, who died of a rare disease at age 4. They talk about her struggles relative to other children and rejoice in how the girl changed their life perspective.	Yes	No
Neutral	A man talks about the time he traveled to New Hampshire to meet the famous but recluse author, J.D. Salinger.	Yes	Yes (baseline)
	A man tells his friend about his job as a doorman at the Plaza Hotel. He describes the job as all about making others happy.	Yes	Yes (baseline)
	A man talks about the satisfaction he gains from helping others as an owner of a pest-control company.	Yes	Yes (critical)
	A man tells his friend about his experience as an announcer for the New York Yankees, during which he announced the president, Dwight Eisenhower, who gave out the first pitch.	Yes	Yes (critical)

Note. All audio clips can be found at www.StoryCorps.org.

Supplementary Table 2.

Mean (SD) ratings of experienced valence, arousal, and specific emotion ratings.

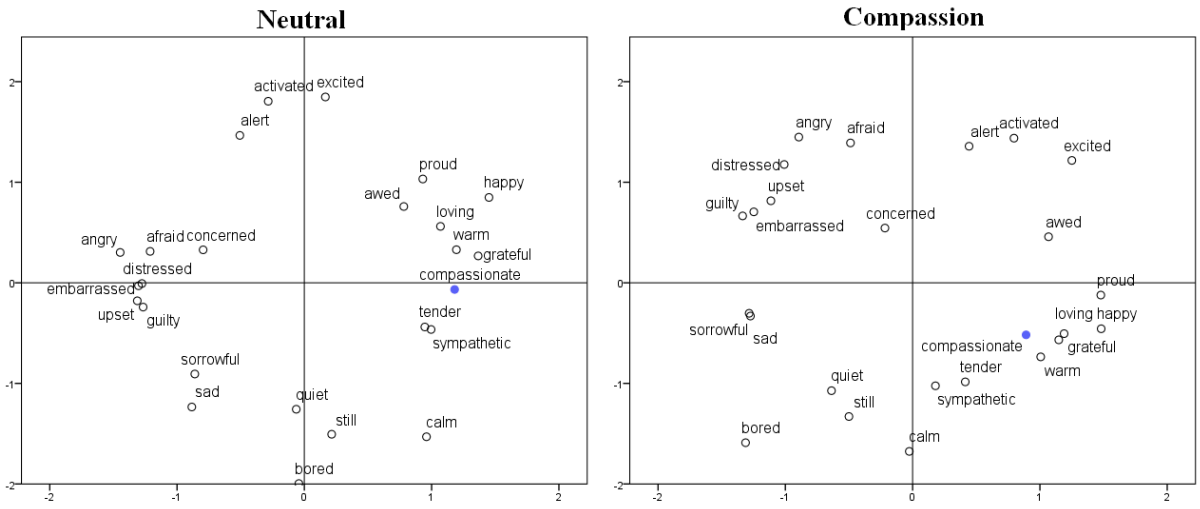
Outcome variable	Pilot Study		Main Study			
	Neutral	Compassion	Neutral		Compassion	
			Baseline	Critical	Baseline	Critical
Valence[#]	6.75 (0.94)	2.86 (1.04)***	6.54 (1.14)	6.15 (0.99)	7.46 (1.05)*	1.88 (0.84)***
Arousal[#]	5.50 (0.73)	4.25 (0.73)***	5.19 (1.30)	5.69 (1.07)	5.19 (1.38)	4.38 (1.37)*
Compassionate	3.21 (1.05)	4.14 (0.66)**	3.69 (1.32)	3.00 (0.91)	2.77 (1.30)†	3.85 (0.99)*
Afraid	1.07 (0.27)	2.36 (1.15)***	1.31 (0.63)	1.23 (0.60)	1.08 (0.28)	3.08 (1.12)***
Alert	3.14 (1.03)	2.43 (1.28)	2.95 (0.76)	3.00 (1.23)	2.92 (1.26)	3.08 (1.12)
Angry	1.29 (0.47)	1.64 (0.93)	1.00 (0.00)	1.46 (0.97)	1.00 (0.00)	2.08 (1.19)***
Awed	2.64 (1.34)	2.36 (1.34)	2.69 (1.32)	2.62 (1.50)	2.69 (1.32)	2.62 (1.33)
Bored	2.14 (0.95)	1.64 (0.74)	2.15 (1.21)	2.08 (1.04)	1.77 (0.83)	1.85 (1.21)
Calm	4.14 (0.95)	2.86 (1.17)**	3.85 (0.80)	3.00 (1.08)	4.00 (0.82)	2.46 (1.33)
Concerned	2.36 (1.22)	4.21 (1.05)***	1.85 (1.07)	1.46 (0.78)	1.38 (0.65)	3.92 (0.95)***
Distressed	1.50 (0.76)	3.14 (1.10)***	1.62 (1.04)	1.46 (0.88)	1.15 (0.38)	3.46 (1.33)***
Excited	3.07 (0.92)	1.21 (0.43)***	3.08 (1.55)	3.38 (1.45)	3.08 (1.04)	1.31 (0.48)***
Grateful	2.07 (1.27)	3.93 (1.49)**	3.54 (1.33)	2.38 (0.96)	2.77 (1.17)	3.15 (1.73)
Guilty	1.43 (1.09)	2.00 (1.30)	1.23 (0.60)	1.08 (0.28)	1.15 (0.38)	1.77 (1.01)*
Happy	3.36 (0.93)	1.86 (0.86)***	3.77 (1.01)	3.46 (1.05)	3.85 (0.69)	1.31 (0.48)***
Loving	2.43 (1.02)	3.50 (0.94)**	3.31 (1.32)	2.77 (1.59)	3.46 (0.97)	3.15 (1.21)
Proud	2.07 (1.27)	2.07 (1.14)	2.92 (1.55)	2.62 (1.61)	2.23 (1.24)	1.38 (0.65)*
Sad	1.64 (1.08)	4.57 (0.51)***	1.54 (0.78)	1.54 (0.66)	1.08 (0.28)†	4.15 (0.56)***
Sorrowful	1.64 (1.08)	4.21 (0.89)***	1.38 (0.87)	1.46 (0.78)	1.15 (0.38)	4.15 (0.69)***
Still	3.29 (1.07)	3.07 (0.83)	3.08 (1.04)	2.77 (1.01)	2.69 (1.11)	3.00 (1.08)
Sympathetic	3.00 (1.47)	4.57 (0.65)***	3.38 (0.77)	2.08 (1.12)	1.62 (0.77)***	4.23 (0.83)***
Tender	3.14 (1.23)	3.93 (0.62)*	2.62 (1.45)	2.23 (1.36)	2.08 (1.26)	2.54 (1.56)
Tired	2.57 (1.22)	2.00 (0.96)	2.08 (1.26)	2.31 (0.86)	2.08 (1.32)	2.46 (1.13)
Troubled	1.57 (0.85)	3.57 (1.09)***	1.15 (0.38)	1.62 (1.12)	1.23 (0.44)	3.77 (1.09)***
Upset	1.36 (0.63)	3.57 (1.09)***	1.31 (0.48)	1.38 (0.65)	1.08 (0.28)	3.92 (1.04)***
Warm	3.57 (0.94)	2.43 (1.22)**	3.62 (1.04)	3.31 (1.32)	3.69 (0.86)	1.92 (1.12)**

Note. [#]indicates a scale of 1 to 9; all other variables measured on a scale of 1 to 5. Flagged comparisons indicate a between-groups difference from the comparable neutral induction. † $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.

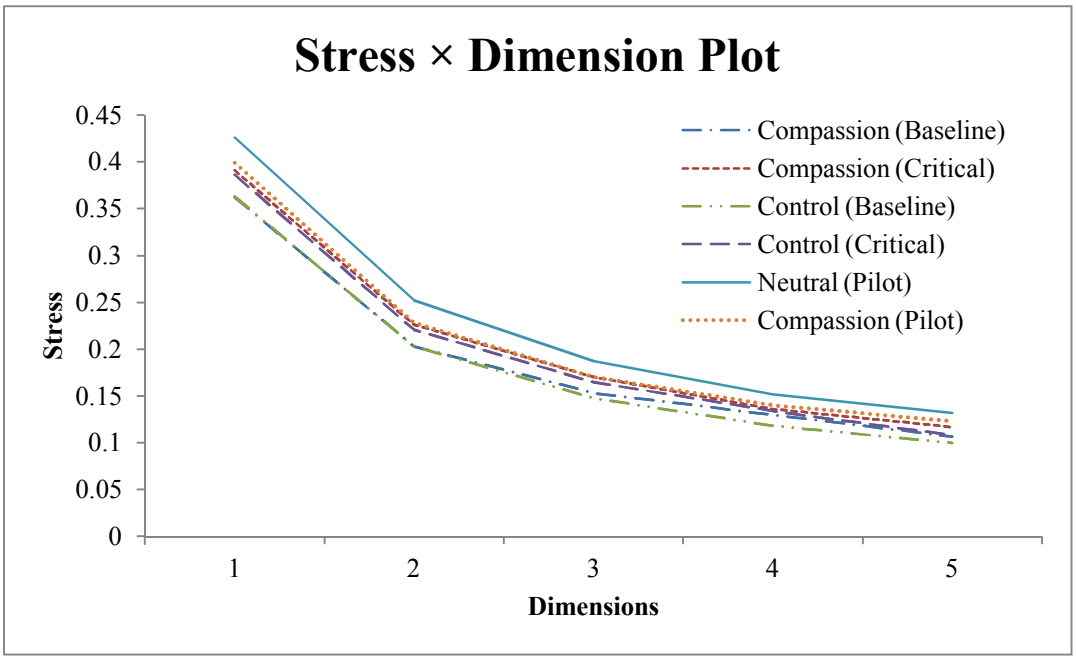
Supplementary Table 3.
Correlations between self-reported compassion, distress, and other unpleasant emotion states following the critical compassion manipulation.

	Main Study		Pilot Study	
	Emotion category		Emotion Category	
Emotion Category	Compassionate	Distressed	Compassionate	Distressed
Compassionate	-	.31	-	.29
Distressed	.31	-	.29	-
Sad	.50†	.46	-.03	.12
Sorrowful	.53†	.46	-.05	.12
Sympathetic	.66*	.57**	.51†	-.02
Tender	.55†	.15	.22	.24
Loving	.65*	.11	.12	-.22
Grateful	.51†	.29	.17	-.18
Upset	.48†	.63**	.41	.31
Afraid	.09	.48†	.23	.32
Angry	.15	.71**	.34	.51†
Concerned	.34	.82***	.17	.50†
Troubled	.43	.71***	.41	.70**
Guilty	.30	.33	.36	.11
Calm	-.39	-.55**	.13	-.04

Note. † $p < .1$; * $p < .05$; ** $p < .01$; *** $p < .001$.



Supplementary Figure 1. Representations of emotion concepts obtained from similarity ratings in pilot study. Valence is the horizontal axis, and arousal is the vertical axis.



Supplementary Figure 2. The fit of each solution at a given dimensionality for the similarity judgments is indicated by a fit statistic (called stress) plotted against the number of dimensions contained in each solution. The stress value indicates the extent of the solution's departure from the observed data. Identifying the "elbow" in the plot indicates the optimal number of dimensions needed to represent the stimulus structure. INDSCAL does not provide a one-dimension solution, thus we performed a nonmetric group Euclidean distance analysis to check the one-dimension stress score. This analysis produced stress values identical to the INDSCAL group solutions. "Elbows" were detected at the two-dimensional solution in all conditions across studies.

References for Supplementary Material

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